

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service

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QUESTIONS AND ANSWERS ABOUT SCREW-WORM CONTROL

- Q. What is the screw-worm?
- A. It is the larva or maggot of the screw-worm fly, Callitroga hominovorax, a parasite of warm-blood animals.
- Q. How does it attack animals?
- A. In nature the screw-worm fly lays its eggs only on the wounds of warm-blooded animals. It deposits its eggs on all kinds of wounds such as navels of new borne animals, fresh abrasions--wire cuts, nail scratches, brand marks, tick bites, grass cuts. Even minor injuries may be infested.
- Q. What is the life cycle of the screw-worm fly?
- A. The average time from generation to generation is about 3 to 4 weeks. Flies can mate when 2 days old and at 6 days a female can lay 250 eggs on a wound which hatch within a day. The larvae--or maggots--leave the wounds after 5 to 6 days and drop to the ground. In the soil, they pupate, developing a dark, hard coating, and after a week of summer weather emerge as adults.
- Q. How are livestock losses suffered by livestockmen?
- A. By deaths, permanent injury, poor weight gains of animals, susceptibility to other disease, as well as cost of labor and material to inspect and treat animals.
- Q. What are the annual costs of this pest to livestockmen of the Southeast?
- A. Between \$10 million and \$15 million.
- Q. What is the screw-worm situation in Florida?
- A. It is said to be the worst since this pest entered the State in 1933. It is estimated that 80 to 85 percent of all wounds of cattle in Florida were infested between June 1, 1956 and May 1957.
- Q. Is a program under way to eradicate the screw-worm in the Southeast?
- A. No.
- Q. What is the current Federal-State screw-worm operation in Florida?

- A. It is a large-scale field test primarily for research and training purposes.
- Q. Who is conducting the field test?
- A. The U. S. Department of Agriculture and the State of Florida, through the State Livestock Board, are cooperating. Florida is furnishing about \$22,000 to help finance the operation. The Federal government, through the Agricultural Research Service, is supplying technical personnel as well as materials and facilities.
- Q. Where are field-test headquarters?
- A. At Orlando, Fla.
- Q. Who is directing the operation?
- A. R. C. Bushland of USDA's Entomology Research Division, Kerrville, Texas, is in over-all charge. Other personnel who have done research or control work on the screw-worm are handling such phases as laboratory rearing, treating, packaging and releasing flies, and checking field results.
- Q. Why is it being conducted?
- A. Principally to evaluate and improve procedures and equipment for eradication of screw-worms by using sterile male screw-worm flies and to train personnel.
- Q. Has such a technique proven successful before?
- A. Yes. The 170-square-mile Caribbean island of Curacao was rid of screw-worm flies by this means in 1954.
- Q. What is the extent of the 1957 field test in Florida?
- A. A 2,000-square-mile area east and south of Orlando. This is largely range land.
- Q. Where are the sterile male screw-worm flies obtained?
- A. They are reared and sterilized in the USDA laboratory at Orlando, Fla.
- Q. How are the screw-worm flies mass-reared in the laboratory?

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A. Although in nature screw-worms can grow only in wounds of living animals, methods have been developed to rear them in a medium of finely-ground fresh beef hearts and blood kept at about 100 degrees F. to simulate the temperature in the wounds of animals. When the larvae or maggots mature they crawl from the medium and drop into sand where they pupate--that is, become encased in their hard, brown shell. After about a week the flies later emerge from the pupae.

Q. How many sterile flies are required in the field test?

A. About 2 million a week at the peak, of which approximately one-half will be male.

Q. How are flies sterilized?

A. They are subjected while in the pupal stage to gamma rays of radioactive cobalt for about 6 minutes.

Q. How are they distributed?

A. By small airplanes, releasing 500 sterile male adults per square mile in the test area each week for four months.

Q. What pattern will the small planes fly?

A. Planes will carry relatively light loads of sterilized insects and will fly at relatively high altitudes--generally about 1,000 feet. They will drop a package of the insects at intervals of about one mile.

Q. How does this control or eradicate screw-worm flies?

A. When normal female screw-worm flies mate with sterile males, the eggs produced will not hatch. If enough sterile male flies can be introduced into a screw-worm infested area at proper intervals, they will cause the majority of the native females to lay eggs that will not hatch, and the fly population will die out.

Q. Will the screw-worm be eradicated in the test area?

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A. No, because screw-worm flies can move into and out of the area. However, researchers can compare reductions in fly populations near the center of the 40-mile by 50-mile test block to fly populations outward beyond the edges where reinfestation would be heaviest, thus obtaining valuable information on control.

Q. What will the field test accomplish?

A. Besides being a proving ground for procedures and equipment, the operation will help train personnel in techniques which would be invaluable if an all-out eradication program should be undertaken in the future. It should also provide limited control of the screw-worm in the pilot test area.

Q. When can an eradication program begin?

A. Not until such a program is authorized and funds become available.

Q. In an all-out regional eradication program, how many sterile flies would be reared each week?

A. About 50 million--25 times the number reared for the 1957 test. Such a program would require greatly expanded mass-rearing facilities.

Q. How long would it take to complete an eradication program?

A. Such a program probably could be completed by the end of two full operating years, not including the time required for construction of necessary buildings and facilities.

Q. What would necessary rearing facilities cost?

A. About a million dollars.

Q. What would such a program cost?

A. Approximately 9 to 10 million dollars.

Q. What steps would be required to maintain a screw-worm-free Southeast?

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A. After an eradication program was completed, constant vigilance would have to be maintained. This would mean enforcement of quarantine, inspection of all livestock entering the Southeast from the west, continuous screw-worm surveys, and standby facilities to promptly eradicate the pest in any locality if it showed up again.

Q. What would be the cost of this phase of an all-out program?

A. About \$750,000 a year.

Q. Is it possible to eradicate the screw-worm fly from the Southeast by releasing sterile male screw-worm flies?

A. USDA officials believe it is.

Q. What area would need to be treated in a Southeast regional eradication program?

A. All of peninsula Florida, the southeastern tip of Georgia for certain and possibly all of the southern half of Georgia, southeastern part of Alabama and southeastern tip of South Carolina--a total area of no less than 50,000 square miles, or 25 times larger than the 1957 field test block and about 300 times larger than the island of Curacao.

Q. What makes control of screw-worms so difficult in Florida?

A. Many cattle and hogs run in woodland and swampland where it is difficult, if not impossible, to find and treat all infested animals without extraordinary expense. In addition wild life serve as hosts to help maintain a high population of flies. Then, too, control is a year-round operation in Florida.

Q. What are the best control measures?

A. Good ranch practices and use of an approved remedy. Animals should be handled carefully at all times to avoid injury. Surgical operations should be avoided when possible during screw-worm seasons--unfortunately, however, in south Florida the screw-worm is active year round. Livestock should be examined once a week and all wounds treated with screw-worm remedies.

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Q. Can livestockmen effectively treat their own infested animals?

A. Yes. Many do.

Q. What remedies are recommended?

A. EQ-335--so called because of its main ingredients which are 3 percent lindane and 35 percent pine oil; and Smear 62, made up mainly of benzol and diphenylamine.

Q. How often should infested wounds be treated?

A. At least once a week until the wound is healed--perhaps twice the first week, if the wound is a large open one.

Q. If all livestockmen treated all their infested animals, would the screw-worm be eradicated from this area?

A. No. The screw-worm also thrives in wounds of wildlife.

Q. What does the screw-worm fly look like?

A. It's bluish or bluish green and about twice the size of a housefly.

Q. How long has the screw-worm been in the United States?

A. It has been known in Texas since 1842.

Q. What is its distribution in the United States?

A. Besides being found in Florida and Texas, it also is present in New Mexico, Arizona, and California, overwintering in the sub-tropical parts of those States. The Florida infestation normally spreads each year into Georgia, Alabama and South Carolina. Occasionally it moves northward and westward into Kentucky, Mississippi, Tennessee, North Carolina, and Virginia. In the Southwest, it may migrate out of Texas into Oklahoma, Kansas, Missouri, and Arkansas. It has become established in summer months in more northern States through shipment of infested animals.

Q. Does the screw-worm cause severe losses in northern areas?

A. Yes. It may cause heavy losses even though outside its normal range, because many stockmen in those areas are not familiar with screw-worms. The pest often does considerable damage and spreads over a large area before it is checked. These costly outbreaks in northern areas have been traced to the shipment of infested animals.

Q. What conditions make eradication feasible in the Southeast?

A. The flies do not normally overwinter north of Gainesville, Fla. By stamping out the flies in the Florida peninsula, reinfestation could be controlled by quarantine measures.